

A model tunnel having a d. c. motor drive of 75 KW at 3000 r.p.m. with Ward Leonard sistem supply, was modified to allow experiments on cascades in bidimensional flow.

Maximum wind velocity is 65 m/s (140 m.p.h.) measured in section 350 x 350 mm (14 x 14 sq. in. ).

Cascade is fixed at the end of a square tube having cross section 350 x 350 mm.

Angular position of cascades is assured by means of a serie of fixed sectors installed between cascade and terminale section of tunnel.

Experiments are performed by means of:

- measure of static pressures on the airfoil;
- measure of flow characteristics ahead and behind cascade;
- visualization of flow at the walls and on airfoil surfaces.

Measures in flow are obtained by means of cylindrical or sphere head anemometers, and total pressure heads.

Analysis of results is made by momentum theory.

Using this apparatus a serie of experiments on cascades was performed. Cascades were formed by NACA 6512 sections having chord 100 mm (4 in.) height 350 mm (14 in.); gap/chord 0,70.

Were tested two dispositions:

- A) as a compressor element with an angle between normal to chord and cascade axis  $\beta = 43^{\circ},6$ ;
- B) as a turbine element having  $\beta = - 46^{\circ},6$ .

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TANK FOR ELECTRICAL ANALOGIES OF THE AERODYNAMIC FIELDS

Two-dimensional field.

Electrodes on the longer sides, with adjustable voltage  
between 5 and 125 Volts, by means of a transform-  
mator.

Aluminium wing-model.

The potential of the model is intermediate between those of  
the plates.

Potentiometer and probe to explore the tension field.

Oscillograph to compare the tensions of the probe and  
of a point fixed to the potentiometers.

Writing-tip to draw equipotential lines on paper sheet.

Control of probe position by means of a pantograph.

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TEST-INTELLATION FOR ENGINE IN HEIGHT-FLY CONDITION

It consists in a chamber (m.2,05 x 1,82 x 1,60) provided with all instruments - brake, tanks, measure-equipment, etc. - required for a test on singel-cylânder engine, whose ambient is rarefied, cooled and ventilated - For this (purpose), the chamber is enclosed in a circle of a tight aerodynamic tunnel, with an ammonia-evaporators battery; the same tunnel is closed in a cell highly from heat.

Combustion-gases, just cooled, are inhraled by an aspirator Rehsteiner.

Temperature and pressure touched in the ambient are:

- 58 F and 8,5 lbs/ sq.inc.

Ventilator horse-power

50 HP

Air speed

150 Km/hour

cooling efficiency

70.000 Refrigerating Unit/hour

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EXPERIMENTAL TURBO-COMPRESSOR

It has been designed at the purpose of controlling aerodynamic theory and calculation methods on cascade airfoils.

The unit consists of: 1) a four-stage axial compressor 2) a single-stage turbine which utilizes the fluid enthalpy at the end of compression 3) a 400 HP electric motor which supplies the supplementary power to drive the compressor.

Interesting features of the group are:

- 1) adjustable setting of both rotor and stator blades
- 2) possibility of measuring air speed, pressure and temperature at all stages and along blade axis.

The characteristics of the group are the following:

Compression ratio		= 1,7
Power supplied to compressor	$N_c$	= 100 HP
Power output of turbine	$N_t$	= 600 HP
Power of electric motor	$N_e$	= 400 HP
Group rotational speed	$n$	= 12.000 r.p.m.
External diameter of compressor	$D$	= 500 mm
Blade section	HACA	= 6512

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